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ABSTRACT

An overview of areas of classroom research explored in the past decade provides a foundation for discussing major conclusions which appear to emerge from recent research findings. The solid demonstration that teachers make a difference in student learning is cited as the chief contribution of classroom research in the 1970s. An example of research on this topic is described and analyzed. A discussion is presented on general topics which characterize present knowledge about effective teaching. Research findings on the topics of active teaching, classroom management, and the relationship between instruction and management are summarized, and an exerpt is given from a research study on how teachers who are effective managers begin the school year. Research on the effects of teacher expectations on student achievement is also reviewed. Future issues are identified to illustrate some of the directions that research in the 1980s should take, including: (1) curriculum; (2) teaching context; (3) classroom task structure; (4) student effects on teachers; and (5) how students perceive and internalize similar teaching behaviors in different ways. Suggestions are offered on integrating quantitive and qualitative classroom research methodologies. (JD)

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Classroom Research: What We Know and What We Need to Know

Thomas L. Good

Report No. 9018

Research in Teacher Education Division

Gary A. Griffin, Program Director

February 1982

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Preface

This paper is one of a series designed to provide research-derived substance to the work of the Research in Teacher Education (RITE) Program Area of the Research and Development Center for Teacher Education at The University of Texas at Austin. RITE's mission is to conceptualize and conduct research into teacher education at all levels of teacher practice -- preservice, induction, and career levels.

A persistent dilemma for those concerned about the issue of knowledge into practice is the blend of decisions which must be made in order to provide teachers (and other school persons) with the highest quality information about the best classroom practices in a manner which is both considerate of teachers' expectations and which has a better-than-even chance for success as a staff development strategy. RITE is concerned that the research on teaching findings are not yet widely used as content for teacher education. Thus, a current research emphasis in the program area is the planning and implementation of a staff development strategy which uses research on teaching findings as its content.

Professor Thomas L. Good is one of a handful of internationally recognized experts in teaching effectiveness research. His reputation is well deserved in that it derives from his direct participation in teaching inquiries as well as in his well-developed skill in providing syntheses of this research. He writes with sensitivity and intellectual rigor. He asks tough questions of his own work and of that of his colleagues. And, he shares his insights and understandings in an exemplary display of collegiality. We are very pleased to present

Professor Good's description of and perceptions about recent research on teaching findings in this publication.

The production of this paper was underwritten in large part by the generosity of the Dean's Development Fund at The University of Texas at Austin. The support of Dean Lorrin Kennamer, College of Education, is acknowledged with pride and gratitude.

Also, editorial assistance by Susan Barnes and production assistance by Freddie Green, both of the RITE staff, are valued and appreciated.

My colleagues and I believe this paper to be one of the most comprehensive and insightful discussions of recent research on teaching. We believe you will also find it so.

Gary A. Griffin, Program Director

Classroom Research:

What We Know and What We Need to Know

In writing this invited paper, I hope to establish in broad terms the nature of classroom research conducted in the past decade, to comment upon its relative strengths and weaknesses, to assess what we know now in the early 1980s that we did not know in the early 1970s, and to discuss the need for specific types of new research. In organizing the paper, it did not seem appropriate to review the many discussions of teacher effectiveness research that have been published in the past few years. It likewise seemed pointless to identify the major sources that have commented upon this literature because this has already been done by a member of the Research in Teacher Education Division of the Research and Development Center for Teacher Education (Barnes, Note 1).

The task of writing a new paper is somewhat awkward because I have written several recent papers which are relevant to the topic I have been asked to address. For example, in one paper (Good, 1979) I selectively explored some of the teacher effectiveness findings. In another paper I have discussed the use and misuse of classroom observation (Good, Note 2) and elsewhere I have emphasized the general research area and its relation to policy issues (Good, Note 3). It seems pointless to repeat arguments that I have made in these papers here, yet it is impossible to write again on this topic without "revisiting" some of the concepts and comments I have made elsewhere.

In this paper, I will emphasize future research needs rather than review activities. This is due to my perception of the direction of the Research in Teacher Education Division as it is developing and

because I have not written upon this aspect of the topic extensively in the past.

Background

Recently, there have been numerous reviews of the teaching effectiveness literature as well as more general reviews of classroom research. This increased review activity has occurred because (a) there has been much classroom research in the past ten years and (b) this research is qualitatively superior to earlier research. Recent teacher effectiveness studies have stressed repeated observation (using reasonably sophisticated data collection methods), and classroom observation has often focused on teachers who have been identified as relatively effective teachers (e.g., teachers were able to obtain better than expected achievement from students).

This new research stands in contrast to earlier forms of research on instruction that examined teacher behavior (and its effects) with rating scales (based upon limited observation and often using procedures without demonstrated reliability or validity). The setting for such research was often a laboratory and simulated activities were frequently employed. Thus, recent reviews have been motivated at least partly by the belief that we currently possess both a greater amount of improved and more reliable information about teaching and its effects on students.

A Promising Beginning

I believe that we do know considerably more about classroom teaching than we did a decade ago. In 1970, the accumulated knowledge about the effects of classroom processes on student achievement was weak and contradictory. In some curriculum areas at the elementary school

level the picture is now more optimistic. Within less than a decade, the literature on basic skill instruction in reading and mathematics in elementary schools has moved from a state of confusion to a point at which experimental studies can be designed upon a data base.

Because such a data base exists, this paper attempts to provide an outline of major results of classroom research, and suggests the implications of such research for practice and teacher education. At the outset, we need to acknowledge that the attempt to describe and/or to affect classroom learning is an enormously complex task. The realization of the complexity of classroom phenomena should cause us to be suspicious of simple models of teaching that offer universal solutions and to be tolerant of (if not encourage) divergent approaches to the study of teaching. Nevertheless, there is much to be learned about the forces that influence classroom thinking, behavior, and outcomes. For example, there is little information about conditions that are associated with achievement in subject areas other than basic skills, and virtually no consistent, reliable data are available concerning how to stimulate student affective growth. Thus, although I am very encouraged by the recent progress achieved by classroom researchers, I am equally impressed by the complexity of the classroom setting and by unexamined and/or unanswered questions that confront classroom research and practice.

Reasons for Progress

Why is it that recent classroom research efforts were successful in relating teacher behavior to student outcomes when countless earlier process-product studies had failed? As Brophy (1979) has noted, progress can be attributed, in part, to three major factors. First, the

important review works by Rosenshine and Furst (1973) and Dunkin and Biddle (1974) helped to summarize what was known about the effects of teaching and were instrumental in bringing a degree of conceptual coherence to the field. The second factor was an increased awareness of the methodological problems inherent in studying teacher effects and the concomitant willingness of investigators to begin to respond to those challenges in creative ways (such thinking in part was stimulated by a national conference on teaching research sponsored in 1974 by the National Institute of Education). For a technical description of design changes associated with recent process-product studies that were seldom incorporated into earlier work, see Brophy (1979). A third factor was the willingness of the National Institute of Education to invest in large-scale process-product research and the ability of researchers to design broad exploratory studies. In particular, the field of teacher behavior changed its research emphasis from "commitments" (Dunkin & Biddle, 1974) and the search for universal dimensions of teaching effectiveness to the study of particular aspects of teaching in more "manageable" contexts.

Examples of New Information Produced by Classroom Research

It seems to me that there are a number of insights which are shared by many classroom researchers today that were not widely accepted or fully understood a decade ago. Whether these ideas are held and disseminated by many teacher educators is less clear to me. For example, I find it surprising that many recent teacher graduates appear unaware of managerial concepts like "withitness" and "overlapping" which have repeatedly been demonstrated to be important considerations in effective management. This is especially surprising since many teacher

educators appear to feel that classroom management is an important teaching task. The access that I have to teachers from many different institutions is limited and thus my perspective on this issue may be inappropriately biased. However, Ken Howey (personal communication) suggests that his survey of over 200 teacher education institutions supports this view. What, then, are some of the new understandings that have emerged or ideas that have changed substantially in the past decade?

School Critics: Effects on Achievement

In the late 1960s and early 1970s it was often assumed that individual teachers, and schooling in general, made little if any difference in student learning. However, data collected in the 1970s indicate that teachers vary widely in their classroom behavior and some research using correlational descriptive procedures followed by field experiments has provided solid evidence that certain patterns of teacher behavior make important differences in student learning (see for example, Anderson, Evertson, & Brophy, 1979; Good & Grouws, 1979). Because of observational research, there is now solid evidence that teachers teaching similar pupils under similar circumstances often behave in different ways and that some of these differences in teacher behavior can be associated with differential learning gains. Furthermore, recent research has illustrated that some of the techniques used by effective teachers can be taught to other teachers who then have used them successfully in instructing students. Hence, observational data have provided solid evidence that teachers make a difference and have begun to provide some important clues about teaching strategies that are associated with these differences.

Although this paper primarily addresses research evidence at the classroom level rather than at more molar levels (e.g., school-wide or school districts effects), I do want to point out that the particular school a student attends may also influence his or her achievement. In 1970, it was popular to argue that schools made little or no difference in student learning. Unfortunately, the research that had led to such pessimistic conclusions focused upon variables such as the number of books in the library, the amount of money spent, etc., and did not look at dynamic classroom process variables (i.e., what teachers and students did in schools). Recent research which has examined actual school processes in carefully selected schools has provided important evidence that schools do in fact influence student achievement in different ways (Rutter, Maughan, Mortimore, Duston, & Smith, 1979). That is, there is reasonable evidence that some schools have more positive effects on student achievement than other schools, even though "more" and "less" effective schools serve students with similar backgrounds and aptitude. Among the many school level variables that were associated with enhanced student achievement are the following: (1) an emphasis on school learning; (2) teachers' involvement in student learning; and (3) high expectations on the part of teachers and other adults that children will learn. Although we know little about how school effects operate and how they interact with teacher or classroom effects, we do have evidence that they exist and this is information that we did not have in 1970. For a good discussion of the "reassessment" of earlier school effectiveness research see Madaus, Airasian, and Kellaghan (1980). For a discussion of possible factors involved in communicating school effects see Stallings and Mohlman (Note 4) and Edmonds (1979).

School Critics: Classroom Behavior

School critics have often described school in pejorative terms and have often claimed that teachers behave in very similar ways. Simple descriptions have often encouraged reformers to provide relatively simple prescriptions for improving classroom teaching and learning. There may be a number of dimensions upon which American schools and teachers can be criticized; however, there is one factor upon which school critics are flatly wrong. That is, teachers exhibit an extra-ordinarily vast number of differences in teaching behavior and technique. This fact has been illustrated repeatedly by observational research collected in the 1970s.

Before introducing a few examples that illustrate variety in teaching behavior, it should be noted that most of the evidence showing classroom variation has been collected at the elementary school level. Whether or not such meaningful variation exists at the secondary level is an open question because there are relatively little data available to describe secondary school processes. It seems clear now, at least at the elementary school level (and perhaps at the secondary level as well), that school critics seriously underestimate the degree of variability present in American schools. This is not to suggest that other criticisms of schooling are not valid. For example, based upon my recent experiences in junior high schools, I suspect that many junior high students find the academic aspects of school boring.

For example, Rosenshine (1980) and Fisher, Filby, Marliave, Cahen, Dishaw, Moore, & Berliner (Note 5) provide data showing that teachers vary greatly in the amount of time that they spend on particular subject areas in elementary schools. Indeed, because a student is assigned to a

particular teacher, they may spend twice (or more!) as much time studying mathematics than the student who lives next door but who is assigned to a different teacher. In addition to the amount of time that teachers spend on a particular subject matter, there is also a great variance in how teachers use that time in presenting a particular subject. For example, Good and Grouws (1977) found that some teachers spend a great deal of time teaching mathematics by assigning seatwork; however, other teachers spend somewhat more time upon the development portion of the lesson (explaining to these students the meaning of the concepts and how to do the work) prior to making seatwork assignments. It can also be noted that how time is utilized in the classroom can be altered in ways to improve student achievement (e.g., Stallings, 1980; Good & Grouws, 1979).

Classrooms vary not only in how teachers distribute time and present subject matter to students, but they also vary widely in how they are organized for classroom learning. Some classrooms are taught basically in whole groups whereas other classrooms are taught in two or three working groups and other classrooms feature a great deal of individualization. In some classrooms, students are encouraged to work and to cooperate with others whereas in other classrooms, teachers are students' primary source of feedback and evaluation. Formal studies of classrooms (e.g., Bossert, 1979) and reviews and conceptualizations of classroom life (Doyle, Note 6) have revealed that classrooms often appear similar but place quite different demands upon students and that other classrooms appear dissimilar but place similar learning demands upon students. Hence, there is now ample data to suggest that teachers both act and structure the classroom in highly different ways. Although

it may be the case that many forms of possible teaching-learning interactions do not appear in classrooms, there are certainly many variations in operations in classroom practice (at least in elementary schools).

Classroom observation has also revealed the fact that program labels do not predict teaching-student behaviors in any meaningful fashion. For example, there are some classrooms labelled open classrooms that provide more structure and teacher directions than classrooms labelled as more traditional. Study after study has revealed the fact that teachers vary widely in how they implement a particular "program." Similarly, many studies have illustrated the fact that the "method" is not as important as is the quality of the teaching (e.g., Chall, 1967). That is, there are some teachers who use individualized methods and have reasonably good effects; whereas, other teachers use whole-class methods and have good effects; and there are teachers who have comparatively little positive impact upon student achievement who use both methods.

The organizational form of instruction makes little difference independent of the quality with which the form is implemented. What does make a difference is the quality with which a particular teaching strategy is implemented. This is to suggest that organizational structure (e.g., Bossert, 1979), the task demands of the learning situation (Doyle, Note 6), and the quality of active and appropriate instruction (Good, 1979) all interact. However, it may be that for the average teacher the use of relatively simple structures which emphasize active teaching may be easier to use in a way that consistently produces student achievement (at least in the short run).

It has been suggested then that recent classroom research has provided some evidence that contradicts some of the school critics' arguments that were made in the late 1960s and early 1970s. We can now say with confidence that (at least in elementary school settings) there is considerable variation in how teachers attempt to teach and in how they structure classrooms for learning. Indeed, Carew and Lightfoot (1979) have illustrated that teachers who teach at the same grade level in the same school vary more on many instructional dimensions than do teachers who teach in different schools, and Brophy and Evertson (1981) and Levine and Mann (Note 7) have provided strong evidence that teachers vary their behavior toward individual students in the classroom. Hence, there are not only differences in general behavior between teachers but also differences in how they distribute time within classrooms. It is also the case that such teacher variance can be associated with differences in student achievement.

Teacher Education

Recent classroom observation has provided surprises for teacher educators as well. Observational research has revealed that teachers often behave in ways that are inconsistent with what is believed to be emphasized in teacher education programs. For example, Brophy (1981) provides data suggesting that teachers praise considerably less than would be expected given the emphasis placed upon the utility of praise in many classroom methodology books. Brophy also contends that this is a good thing given the fact that teachers often use praise in ways that are highly inappropriate. Researchers on teaching planning (Peterson, Marx, & Clark, 1978) have also revealed that popular notions about how teachers do and should plan are not the strategies that teachers

actually use in the context of real classroom pressures and teaching. Observational research has made the point that teachers not only vary from one another in how they teach and structure classroom learning, but that there is variance in some teachers from practices recommended in teacher education programs.

One of the most powerful examples of "surprises" revealed by observational work is reflected in the work of Kounin (1970) and several other researchers who have used his concepts and ideas in subsequent work. At one time, educators believed that how misbehavior was dealt with was a critical teaching act. Subsequent research has found that regardless of how teachers reacted to misbehavior, instructional time was lost for many students and that the key to good management was preventing problems. Research in the 1970s has revealed several strategies that successful managers use to minimize needless interruptions or delays.

It would be possible to illustrate other information gained from observational research in the 1970s; however, the above examples should be sufficient for making the point that observational research has begun to pay off. Although it is beyond the scope of this paper to provide methodological details, it is important to emphasize that these gains in knowledge were obtained not only through use of observational procedures but also because of more observations during research. The gains in knowledge were also obtained because better instruments were utilized, better sampling techniques were employed in selecting teachers for study (often selecting only teachers who had demonstrated an ability to improve student learning over a period of time), and by observational

procedures that were beginning to become more sensitive to the perceptions of individual teachers and students.

Interpretation

As might be expected, some of the new information that has been gained through classroom observation has been reacted to in simple-minded ways. As a case point, some enthusiasts have reacted to the knowledge that individual teachers provide different amounts of time for a subject by arguing that the allocation of more time per se will improve student learning. However, such simple notions have been challenged conceptually by educators (e.g., see Griffin, Webb, & Confrey, 1981). Furthermore, a more "complex view" of time has found empirical support in the work of Good and Grouws (1977; 1979), who present evidence to suggest that how time is used is more important than the amount of time per se. The point here is that at least some educators are becoming more interested in the relationships among variables and are becoming more resistant to the impulse to overrespond to a single variable no matter how appealing it may be. Still, the application of research findings to practical problems remains a complex and poorly understood activity.

In this paper, I plan to present major conclusions that in my opinion appear to emerge from recent research. The discussion of how these findings should be integrated into teacher education programs is beyond the scope of this paper. However, I do want to present the general belief that recent findings need to be taught in a decision making fashion as the implementation of this recent research base necessarily has to change as the teaching context (e.g., developmental levels of student) and as content varies. To be more explicit every

teaching variable has to be adjusted to a teaching context (e.g., teachers can do too little or too much alerting and some situations demand more alerting than do others).

Teachers Make a Difference

In my opinion the chief contribution of classroom research in the 1970s was the solid demonstration that teachers make an important difference in student learning, at least in core subject matter areas in elementary schools. This conclusion has been obvious (but undemonstrated) to some individuals who have spent time in different classrooms in the same grade level. However, many educators and citizens had considerable doubts about whether schools or teachers could make any practical difference in student learning.

Missouri Mathematics Program: An Example

It is beyond the scope of this paper to describe all of the research in this area; however, it does seem useful to illustrate briefly one program of research that has demonstrated a teacher effect. About ten years ago, Doug Grouws and I became interested in trying to see if teachers made a difference in mathematics learning. We decided to study mathematics because we felt that it was an important part of the elementary school curriculum and that teacher effects would be more evident in mathematics than in subjects like reading. We wanted to avoid as much as possible subjects where teaching influence might be contaminated by home influences (e.g., most parents won't attempt to teach new mathematics).

We also wanted to find a large school district where the same textbook was used in all classrooms (to rule out the competing claim that the textbook made the difference and not the teacher) and a school

district which had relatively comparable classrooms in different schools (so as to minimize the possibility that some classrooms were more teachable than others). Finally, we needed a school district that was relatively stable in terms of students and teachers. If teachers are not effective in a given year it may be due to the fact that they have classes with different types of students from one year to the next or because they receive students from teachers who emphasize different types of curricula. (For a review of the effects of curriculum materials on student learning see Walker and Schaffarzick, 1974).

We found that it was possible to identify teachers who consistently obtained more mean classroom achievement than did other teachers who were teaching similar students under similar circumstances. Importantly, in our subsequent observational work it proved possible to identify sets of classroom behaviors that consistently differentiated relatively effective from relatively ineffective teachers. In general, it was found that effective fourth-grade mathematics teachers, in contrast to less effective teachers: presented information more actively and clearly; were task-focused (most of the instructional period was spent on mathematics, not socialization); were basically nonevaluative and created a relatively relaxed and pleasant learning environment (comparatively little praise or criticism); expressed higher achievement expectations (more homework, faster pace, more alert environment); and had fewer behavioral problems.

As we have noted elsewhere (Good & Grouws, 1979) we were pleased that it was possible to isolate patterns of instructional behavior which were associated with student achievement. However, we were well aware of the possibility that many factors other than the behavior we had

observed in high-achievement classrooms might be responsible for the higher achievement of students. For example, perhaps more effective teachers plan more thoroughly and because of this they are more task-focused, assign more homework, and so on.

Our initial findings were sufficiently interesting to us that we decided to design a teaching program in order to test the ideas in a field experiment. In designing our treatment program we were especially aware of our naturalistic findings, but we also built upon the work of other process-product researchers, drew upon extant experimental work in mathematics education, and used our own hunches and insights stimulated by classroom observation.

As pointed out elsewhere (Good, Grouws, Beckerman, Ebmeier, Flatt, & Schneeberger, Note 8), the research program was conceptualized as a system of instruction: (1) instructional activity is initiated and reviewed in the context of meaning; (2) students are prepared for each lesson stage to enhance involvement and to minimize errors; (3) the principles of distributed and successful practice are built into the program; (4) active teaching is demanded, especially in the developmental portion of the lesson (when the teacher explains the concept that is being studied, its importance, and so on). An overview of the program is shown in Figure 1.

To test the program, we utilized 40 classrooms in the Tulsa, Oklahoma, public school system. Roughly half of these classrooms were assigned to experimental and control conditions. Experimental teachers read a 45-page manual and were given approximately two and one half hours of training.

Daily Review (First 8 minutes except Mondays)

a) review the concepts and skills associated with the homework
b) collect and deal with homework assignments
c) ask several mental computation exercises

Development (About 20 minutes)

a) briefly focus on prerequisite skills and concepts
b) focus on meaning and promoting student understanding by using explanations, demonstrations, process explanations, illustrations, etc.
c) assess student comprehension

Figure 1. Summary of Key Instructional Behaviors

1) using process-product questions (active interaction)
2) using controlled practice

d) repeat and elaborate on the meaning portion as necessary

Seatwork (About 15 minutes)

a) provide uninterrupted successful practice
b) momentum--keep the ball rolling--get everyone involved, then sustain involvement
c) alerting--let students know their work will be checked at end of period
d) accountability--check the students' work

Homework Assignment

a) assigning on a regular basis at the end of each math class except Fridays
b) should involve about 15 minutes of work to be done at home
c) should include one or two review problems

Special Reviews

a) Weekly Review/Maintenance
   1) conduct during the first 20 minutes each Monday
   2) focus on skills and concepts covered during the previous week
b) Monthly Review/Maintenance
   1) conduct every fourth Monday
   2) focus on skills and concepts covered since the last monthly review

Figure 1. Summary of Key Instructional Behaviors

Space limitations prohibit and extended discussion of our procedures and findings (see Good & Grouws, 1979; and Ebmeier & Good, 1979, for more details). Briefly, it was found that the experimental teachers produced more student gain than control teachers (although control classrooms demonstrated more gain than would have been predicted on the basis of entering student scores). Gains in the experimental classrooms continued for at least a few months after the instructional program ended (this was reflected in routine end-of-year testing conducted by the Tulsa Public School District), and teacher and student attitudes toward the program were favorable.

I do not intend to imply that we now know how mathematics can be taught effectively in elementary schools. Although it is important to note that teachers who used our treatment program obtained good results, it is equally important to realize that a few teachers in control groups appeared to achieve as well as treatment teachers, and hence, there are alternative systems of instruction that can be used effectively by certain teacher. Our purpose was not to build the best mathematics program, but rather to test the plausibility of the teacher effect.

Our research on mathematics instruction at the elementary school level has convinced us that teachers do make a difference in student learning and that inservice teachers can be trained in such a way that student performance can be increased. This belief that teachers can make a difference is reinforced by the work of others who have used procedures similar to those described above and who have also shown a teacher effect (Anderson, et al., 1979; Crawford & Stallings, Note 9; Stallings & Hentzell, Note 10).

The importance of such process-product research is reflected in comments by Patricia Graham, the former director of the National Institution of Education. Graham (1979) writes:

> . . . family, media, and peer influences, taken together, may be more important than schooling in determining a student's values and chances to succeed later in life. A variety of evidence has accumulated, however, to support the position that the classroom teacher is the most powerful single factor affecting academic achievement.

For an especially good review of recent research supporting the contention that teachers make a difference see Gage and Giaconia (Note 11). This review not only provides technical details describing samples, methodology, and findings but also illustrates the practical significance (e.g., variation in learning accounted for by teacher behavior) of such research.

Theory

Elsewhere (Good, Note 3) I have commented positively upon the importance of the recent teacher effectiveness research that has been conducted but also argue that we need to begin to develop explanatory systems if the research effort is to be integrated meaningfully with classroom practice. I repeat this argument that we need to develop theory here.

> Given the paucity of information about classroom practice that existed in the late 1960s, the attempt to gain normative information about classroom practice using theoretical approaches was probably useful. This search for dimensions of teaching that might relate to student performance was probably somewhat

broader than it would have been had narrow but carefully articulated dimensions of teaching been pursued. However, I personally feel that we have now reached the point in classroom research where attempts to develop better theories and better models of instructional process are acutely needed.

As a case in point, we have evidence that the Missouri Mathematics Program in general had a positive impact upon the mean performance of students in experimental classrooms, but we have no data to explain why the program worked. I suspect that the program had an impact because many elementary school teachers simply do not emphasize the meaning of the mathematical concepts. Too much mathematics work in elementary schools involves a brief teacher presentation and a long period of seatwork. Such brief explanations for seatwork do not allow for meaningful and successful practice of concepts that have been taught, and the conditions necessary for students to discover or use principles on their own are also lacking. (Good, Note 3).

It seems plausible that the emphasis in our program upon the development stage of the lesson leads teachers to think more deeply about the concepts that they are presenting and to search more actively for better ways of presenting those concepts to students. Furthermore, because of the way in which the development stage of the lesson is conducted, the program of instruction should allow teachers to see students'

errors before they have a chance to practice those mistakes for a long period of time. This feature of the program seems to be especially desirable because some research has suggested that it is very difficult for students to tell teachers that they do not understand instruction. The clear development lesson would help students to understand more fully the concepts that they must master and how those concepts are related to other concepts that they have learned. The development phase of the lesson thus helps both teachers and students to develop a better rationale for learning activities and to develop a sense of continuity.

The controlled practice portion of the lesson aids both teachers and students in understanding whether the basic concepts and mechanics are being understood. This is especially the case if teachers have developed the expectation that initial teaching often is associated with less than adequate student comprehension and that student mistakes call for reteaching, not rationalization. Such information can allow teachers to correct and to reteach aspects of the lesson so that students develop appropriate conceptual understandings and skills prior to sustained practice. Also, it is hypothesized that students would be much more active thinkers during the development and controlled practice portions of the lesson. This is because students know that seatwork and their homework are intimately related to these

activities. Hence, successful understanding during controlled practice leads to successful seatwork and successful homework. The checking of seatwork allows teachers one final opportunity to correct misunderstandings prior to the assignment of homework.

Following successful practice, brief homework assignments should offer students positive learning experiences that provide for both better integration of material and also the development of more appropriate student attitudes about mathematics and their ability to learn it. In particular, students will probably conclude that increased personal effort during mathematics instruction leads to positive learning experiences. Students would thus be presenting more positive feedback to teachers about mathematics instruction (e.g., handing in completed homework and exhibiting positive verbal and non-verbal behaviors during mathematics instruction, which in turn increase teachers' expectations that they can present mathematics effectively, leading to renewed efforts on their part to carefully plan and teach the mathematics lesson).

The preceding statements are only a few of the beliefs and hypotheses that we hold about <u>why</u> the mathematics program was working. It is important to note that these hypotheses need to be tested if a more adequate understanding of the

antecedent conditions necessary for successful mathematics learning is to be developed. For example, research is needed to determine if in fact experimental teachers identify more student errors and can more readily understand those mistakes during the development stage than do control teachers who use different teaching techniques. It would be equally important to determine whether students in experimental classrooms are more active thinkers during the developmental portion of the lesson than are students in control classrooms (perhaps by asking students to do problems immediately after the development portion of the lesson). Similarly, more research is needed concerning the conditions under which student errors are developmentally helpful and lead to increased student effort to integrate material, rather than debilitating and convincing students that they do not understand mathematics. When teaching effectiveness researchers begin to examine their embedded assumptions by testing the specific ways in which student learning is influenced, the conditions under which certain teaching and learning strategies are useful will become clearer than they are at present. (Good, Note 3, p. 45-48).

Naturalistic data have illustrated that some teachers have more effect on student achievement than do other teachers. However, we have no data about how and why these teachers came to develop successful teaching styles on their own. Data about antecedent conditions that influence the development of particular teaching styles would be very

useful information and would contribute heavily toward the development of a theoretical understanding of how classrooms work.

How Do Teachers Make a Difference?

Heuristically, recent process-product studies illustrate a teacher effect and provide validity data for the relative effectiveness of the instructional programs being tested. They do not suggest the way to teach, but they do suggest plausible approaches to instruction. Also, readers should remember that those results pertain only to basic skill achievement in elementary schools, and to some extent to secondary schools.

In this section of the paper, I will suggest that three general topics have emerged for characterizing what we presently know about effective teaching. These topic ares seem to have some relevance for teacher education if they are seen as stimulation for thinking about instruction (rather than as a set of rules).

Active Teaching

The concept of active teaching summarizes a set of findings from process-product correlational studies and field experiments. It seems to represent a mini-model that is applicable to a definable set of classroom situations. The concept refers to this set of findings that resulted from recent process-product work which compared more and less effective teachers (Good, 1979). However, others more frequently refer to this construct as direct instruction. I prefer the active teaching description because this label suggests a broader philosophical base (active teaching can occur in classrooms using a variety of classroom

organizational structures) and because active teaching should become somewhat less direct as students become more mature or as instructional goals become concerned with affective and process outcomes (Good, 1979).

I have argued elsewhere (Good, 1979) that the basic concept emerging from recent process-product findings is active teaching. A teacher sets and articulates learning goals, actively assesses student progress, and frequently makes class presentations illustrating how to do assigned work. Active teaching does not occur when teachers do not actively present the process or concept under study, when they fail to supervise student seatwork actively, or if they do not hold students accountable for their work. Active teaching represents a conceptual continuum which an individual teacher has to adjust to his or her class and to the particular type of material being taught.

Jere Brophy (1979) has nicely summarized the pattern of findings I call active teaching in the following way.

> In summary, learning gains are more impressive in classrooms in which students receive a great deal of instruction from and have a great deal of interaction with the teacher, especially in public lessons and recitations that are briskly paced but conducted at a difficulty level that allows consistent success (p. 747).

Rosenshine (1979) suggests that some of the following teaching acts are critical aspects of teaching he calls direct instruction: (a) a clear focus on academic goals; (b) an effort to promote extensive content coverage and high levels of student involvement in classroom tasks; (c) instructional goals and materials and active monitoring of student progress toward those goals; (d) structured learning activities

and feedback which is immediate and academically oriented; (e) an environment that is task-oriented but relaxed.

The concept of active teaching is applicable to core subjects (e.g., mathematics and reading) in elementary schools when achievement goals are of primary interest. Active teaching may be inconsistent with the goals of certain subjects (e.g., social studies) where process goals are more important than product goals. Recent research in secondary schools has illustrated the general utility of this concept, as well as some of its contextual limitations. For example, Stallings, Needels, and Stayrook (Note 12) have demonstrated that the general principles of active teaching apply to the improvement of reading in secondary schools (a product goal). Evertson, Anderson, and Brophy (Note 13) in a correlational study found that the construct of active teaching makes good sense (if achievement is defined as product oriented) in junior high mathematics classrooms, but not in English classrooms. Similarly, Good and Grouws (Note 14) have produced some support for the active teaching model in a field experiment in eight grade mathematics classrooms.

As I have noted elsewhere, there is reasonable support for the construct of active teaching. However, teaching educators need to keep some basic qualifications in mind.

> Within the context that it has been studied (math, reading. short-term achievement goals) direct instruction appears to be a consistently effective teaching method. These results may be useful for educators, if they do not overreact to them. If. . .seen as a set of specific behaviors or as a generic form of teaching that transcends

all settings, then it is another polemic. . .another educational shibboleth. However, if it is used as an orienting concept that has to be adjusted sensibly and sensitively to different educational settings, then the concept has some value for the practitioner. (Good, 1979, p. 63).

To be as explicit as possible about the distinction between guideline and prescription and between requests for research purposes vs. recommendation for practice generally, I want to discuss one of the variables examined in the Missouri Mathematics Program of research (Good & Grouws, 1979). Teachers were asked to teach the class as a whole. For research purposes we recommended this method to teachers as a behavioral prescription. As noted above, whole-class teaching, along with many other instructional activities, was associated with increased student achievement in the project. However, despite this research finding, I do not believe that all elementary school teachers should necessarily teach mathematics to the class as a whole.

It seems that the concept of active teaching could also be applied in classrooms where teachers organize mathematics teaching to groups of students rather than to the whole class. Hence, research from my viewpoint suggests ways to examine teaching practices but does not provide behavioral prescriptions for classroom application. Clearly, since teacher and student behavior during small-group mathematics instruction was not actively observed, the research cannot provide specific information about ways that seem to make more or less impact during small-group instruction.

It does seem, however, that the research can be useful to teachers who teach mathematics to small groups of students by identifying points of "tensions" or concepts for reacting to their own classroom practice. For example, "group teachers" who read our results might be motivated to ask themselves, "How can I build in a comprehensive development phase for two groups of students each day?" (If two developmental lessons are not possible each day, how can practice be structured in such a way as to be sure that it is a necessary and meaningful activity?) Obviously, it would be important to examine the mathematics program in the context of groups of teachers who obtain varying levels of student performance in order to make more confident statements about classroom practice. Ultimately, though, teachers have to apply information and concepts to their own teaching situations. Although a closer correspondence between the setting in which research was done (e.g., whole class teaching) and the conditions under which one teaches may lessen the number of inferences that one has to make in applying research, it will never eliminate the need for teacher judgment and thinking: research does not yield behavioral prescriptions.

Support for active teaching has been obtained by methods other than process-product research. In a well-controlled laboratory study, Webb (Note 15) compared learning in individual or group settings (no adult teacher was present). In the group study, eleventh-grade students were assigned to 12 four-person groups. There were two homogeneous ability groups at each level (high, middle, low) and six mixed-ability groups (one high and one low, as well as two middle-ability students in each group). Webb found that the impact of the group on individual learning was dependent upon the ability of the student, the ability of the

student relative to that of the other group members, as well as the role the student played in the group.

However, it was found that in those groups where capable students actively taught, learning was enhanced. In mixed-ability classrooms low students who received feedback from more able students did better than those who did not. In general, active participation (both giving and receiving explanations) was found to facilitate learning. Thus, within the context of student group learning in this particular study, it was found that active teaching was consistently associated with learning gains. Thus, it seems that when achievement is the desired goal, the construct of active teaching may have general, but certainly not universal, application value.

It is clear from our own data on mathematics instruction (Ebmeier & Good, 1979; Ebmeier, Good, & Grouws, Note 16) that the particular form of active teaching we tested had different effects upon different types of students in fourth- and sixth-grade classrooms. We have also found that different types of teachers use the program in different ways (Ebmeier & Good, 1979). Thus, it would seem that active teaching is a concept that has relevance for teachers as a viable way to think about organizing the classroom for achievement gains; however, it is not a behavioral prescription.

Classroom Management

In the 1960s it was popular to view classroom management as classroom discipline and considerable emphasis was placed upon what to do after students misbehaved. Research initiated by Kounin (1970) and validated and expanded by a number of researchers in the past few years has stongly illustrated that good classroom managers (and instructors,

for that matter) are not sharply differentiated in terms of how they react to student misbehavior. The key behaviors that distinguish good classroom managers are techniques which prevent misbehavior by eliciting student cooperation in general and involvement in assigned work specifically. Much is now known about these general managerial principles and about proactive teacher behavior. Kounin's book, Discipline and Group Management in Classrooms, is a classic in my opinion and should be read by all persons involved in teacher education programs. The concepts are graphic (withitness) and conceptually helpful. It seems pointless to repeat Kounin's original writings in this paper because they are clearly presented for teacher educators and researchers.

As I have noted previously (Good, 1979), teachers' managerial abilities have been found to relate positively to student achievement in every process-product study conducted to date. Many classroom management principles appear to be applicable to a variety of teaching situations (for details see Good & Brophy, 1980). It seems that teacher managerial skills are necessary if reasonable pupil achievement is to occur, and these concepts and principles should be included in preservice teacher training programs. Summaries of important management principles and their implications for classroom teaching have been presented elsewhere.

There are many other sources of material available for students that emphasize classroom management principles generally and present Kounin's concepts specifically. For example, one entire yearbook of the National Society for the Study of Education (Duke, 1979) is devoted to the topic of classroom management. Another good source is Looking in

Classrooms (Good & Brophy, 1978). This text emphasizes Kounin's distinction between reactive and proactive classroom management and presents considerable discussion of how teachers can prevent problems.

Another source of information on translating classroom management research into classroom practice is the research program on classroom management (COET) at The University of Texas Research and Development Center for Teacher Education. This program was conceptualized and coordinated for several years by Carolyn Evertson and is now headed by Edmund Emmer. The COET program has been active in testing previous concepts related to classroom management (especially those of Kounin) as well as in generating new ideas and concepts. It is beyond the score of this paper to discuss all of the COET research, but I do want to present one of their studies briefly in order to illustrate the utility and general direction of the program as a whole.

Classroom Research: An Example

In one study the COET staff attempted to learn how teachers who are effective managers begin the school year (Emmer, Evertson, & Anderson, 1980). In this study, 27 third-grade teachers were observed extensively during the first week of school as well as throughout the year. As in some of the research discussed in a previous section of this paper, these investigators attempted to identify teachers who had comparable classes at the beginning of the year but differed in their management effectiveness during the year. Such a sample makes it more likely that researchers will find teaching variables of interest because the sample (a) contains behavioral differences (i.e., teachers are known to differ in effects or behaviors), and (b) it seems plausible to associate such

differences with teacher or classroom behavior (e.g., student variables have been controlled to some extent).

As has been noted earlier in the paper, the "form" of instruction is often less important than the quality of implementation. The findings of the research by Emmer, et al., (1980) are consistent with this general argument: the form of the management system did not appear to be as important as the quality with which it was implemented. The authors put it this way:

> Both groups of teachers had rules and procedures for their classes. What distinguished the more effective managers was the degree to which the rules and procedures were integrated into a workable system and how effectively the system was taught to the children. . .The better managers typically spent considerable time during the first week explaining and reminding students of the rules. Their pupils were not uniformly "ready" after the first day or two, and several of the teachers had relatively high amounts of off-task behavior at first. However, they taught the pupils to behave appropriately, through a variety of means (p. 224-225).

Although effective managers differed from ineffective managers, in part, because of unique techniques that they used (which less effective managers failed to use), the effective teachers were better managers primarily because of their clear goals, commitment to teach these goals, and their systematic follow-through. These teachers took the time to teach the managerial systems they wanted to use in their classrooms. Briefly put, the teachers were proactive.

Better managers seemed to have built a communication system that helped students to identify how to respond appropriately without teacher direction in the classroom. The researchers contended that more effective managers seemed to have a sense of students' perceptions and needs. They noted that effective managers in contrast to less effective managers, first taught students rules related to their most immediate needs (e.g., where to put the lunch box, how to obtain permission to use the bathroom, etc.). Also, they noted that more effective managers were more likely than less effective managers to appropriately consider the following factors in relation to lesson design: (a) attention span of students; (b) relation of lesson content to students' interests; (c) appropriate work standards; and (d) assurance of reasonably high level of student success. It seems that the naturalistic paradigm--identifying different levels of success and describing how teacher behaviors are associated with high and low levels of success--was successfully applied to the area of classroom management (just as previous researchers had been successful in identifying teachers who were more and less successful in obtaining student achievement).

However, these results were only correlational, and Evertson and colleagues then turned their attention to validating these initial findings. They wanted to determine whether the general approach to classroom management that characterized the more effective teachers could be taught to other teachers determining the effects of such training upon subsequent teacher and student behavior. Among the many questions that the project staff wanted to address were: (a) would teachers be willing to use the program; (b) could they use the concepts and behaviors in ways similar to the way effective teachers had used

them in the original research; and (c) would the training positively enhance student involvement in lessons?

As a first step in answering these questions, Evertson, Emmer, and other members of the COET staff prepared manuals (for elementary and junior high populations) translating recent research on effective classroom management information into suggestions for classroom practice. They included their beginning-of-the-year work as well as the other management work completed at the Research and Development Center for Teacher Education and research conducted elsewhere. These manuals and training procedures are still being evaluated and thus the contents and procedures will not be discussed here. However, it is possible to state that the elementary school manual and training program (which is one year further along in its development than the junior high materials) have been implemented and reacted to favorably by teachers and have been associated with increased student involvement in classroom activities.

There is, therefore, convincing evidence that it is possible to describe how less and more able managers differ in their classroom behavior and there are data which show that, at least at the elementary school level, it is possible to teach managerial strategies to teachers so that their students' involvement in lesson activities is increased. These studies have used a paradigm that is generally similar to the one used by process-product researchers in studying teachers' effects on student achievement (e.g., Anderson, et al., 1979; Good & Grouws, 1979).

Instruction and Management

It should be noted that many of the principles built into the effective teaching programs (mentioned in an earlier section of the

paper--e.g., Stallings, 1980; Anderson et al., 1979) involved managerial considerations. For example in the Missouri Mathematics Program (Good, et al., Note 8) considerable emphasis was placed upon managerial issues (e.g., getting and maintaining student attention; using alerting and accountability principles appropriately) as well as instructional issues (e.g., distributed practice and review; the ratio of development to seatwork practice, etc.). A similar combination of managerial and instructional advice is found in the program developed for first grade reading instruction by Anderson et al., (1979). In many ways, it appears that research on effective teachers has produced more knowledge of managerial than instructional variables.

The relationship between instruction and classroom management is a close one. Brophy (1979) has argued that if research efforts are to yield more insight into effective instructional processes, it may be necessary to study teachers who possess at least minimal managerial skills. The rationale for this contention is that if teachers aren't effective managers, the other important skills which they possess are not likely to have an impact on students.

Need for Theory

The boundaries between instruction and management become "blurred" upon examination. It seems that some managerial issues or instructional issues change, depending upon the subject matter and whether process or product goals are being pursued. For example, from the standpoint of a teacher pursuing achievement goals in mathematics, student attentiveness and participation are largely managerial issues. From the standpoint of a social studies teacher pursuing process goals, the form of attentiveness and level of participation may be instructional issues.

Another way to illustrate the "boundary" problem is the seatwork that elementary school teachers assign for students to complete while they actively work with a small group. If the work is designed to be very simple (so that the teacher is not interrupted while working with a reading group), is seatwork part of the instructional or managerial system?

This discussion is included to remind the reader that classroom management has traditionally been viewed as a product variable (e.g., maintain student attention). Research has yielded important facts and concepts concerning management, but it seems important to realize that other ways of viewing this variable have not been explored. I concur with Brophy's (1979) call for attempts to study instructional issues which are independent of classroom management. In order to do so, however, we need better definitions of management and instruction than we presently have. We need to more adequately consider the definitions of instruction and management and to study these issues both from process and product perspectives. It is also the case that we need to better conceptualize <u>why</u> classroom management strategies appear to work and to begin to test specific theoretical arguments in future research. Similar attention also needs to be paid to why teachers who were observed to be effective (without intervention) developed these particular managerial strategies.

Importantly, classroom researchers have begun to explore managerial issues in a <u>contextual</u> framework. Evertson (Note 17) utilized this approach in her study of junior high teachers of high- and low-ability classes. Her data show that despite the fact that lower ability classes are smaller, they are considerably more difficult to manage. Most

teachers were found to teach their high- and low-ability classes in similar ways (which may in part explain why teachers have managerial problems with low students!). Evertson's work uses both qualitative nd quantitative research techniques in the attempt to find ways of increasing student cooperation in low-ability classes. Her data suggest that the differential behaviors of low-ability and high-ability classes call for somewhat different patterns of classroom management. This work represents an important step in understanding how to adjust general managerial styles to particular types of classrooms. Utimately other contexts need to be explored. Nevertheless, the general managerial principles that have been established by recent classroom research appear to be applicable to both elementary and secondary classrooms, especially when management is viewed as a prerequisite for achievement.

Teacher Expectation

Teacher expectation effects are another area of classroom research that has been actively and profitably explored in the past decade. There are now consistent data to illustrate that positive teacher expectations are associated with student achievement gains. Brophy and Evertson (1976), in a large study that included extensive measurement of teachers' beliefs and attitudes as well as classroom behavior and student achievement, found that teachers who were obtaining the most achievement from students were teachers who perceived students as capable of learning school work and who viewed themselves as capable of teaching the curriculum. McDonald and Elias (Note 18) have also produced data which support a positive relationship between teacher expectations and student achievement.

Researchers interested in school effects (such as distinguishing characteristics of high- and low-achieving schools serving similar student populations) have identified teacher expectations as a key factor. Both in the United States (Brookover, Schweitzer, Schneider, Beady, Flood, & Wisenbaker, 1978) and in the United Kingdom (Rutter et al., 1979) it has been found that the teachers in high-achievement schools appear to be distinguished from those in less effective schools by the belief that students can and will learn. Teachers in these high-achievement schools also seem to be more active classroom teachers (Brookover et al., 1978). It should be noted that these studies are correlational and that it could be argued that teachers held higher expectations in some instances because students were achieving at high levels.

Other data provide a stronger base for inferring causal direction. Crano and Mellon (1978) estimated the teacher expectation-student behavior influence issue. They used a data set drawn from a four-year longitudinal study of 4,300 students in order to conduct a series of cross-lagged panel correlational analyses. They concluded that teachers' expectations appeared to cause student achievement to a greater extent than student achievement affected teacher attitudes. Although interesting, these data are still correlational and do not settle the causality issue.

Other work has also helped to demonstrate the plausibility of teacher expectation effects. Mary Martin and Sam Kerman worked with a group of teachers who taught in inner-city schools in Los Angeles. They sensitized teachers to potential ways in which low expectations might be communicated to students using the dyadic system (Brophy & Good, 1970a),

and presented to teachers some of the findings derived from work that Jere Brophy and I have been conducting (Brophy & Good, 1970b; Good & Brophy, 1973). Their results showed that experimental teachers (after training) were able to elicit better student achievement and more favorable attitudes than were control teachers (Martin, Note 19). Part of the training also involved the opportunity for teachers to be observed (and to receive feedback), as well as the chance to observe other teachers. Some of the change and improvement might have been due to new techniques acquired during observation, so it is not possible to state that higher teacher expectations necessarily resulted in increased student performance. However, it does seem plausible that the teachers' greater confidence in their ability to work with low achievers was a partial determinant of pupil achievement. I suspect that teaching skills are very important, but if teachers are not motivated to use their skills or to develop them, less effective teaching will follow.

Reviews of teacher expectation research (Cooper & Good, Note 20; Good, 1981; Brophy & Good, 1974) suggest that it is reasonable to conclude that teacher expectations are <u>associated</u> with student achievement. That is, even if teacher expectations do not cause student achievement they may serve to <u>sustain</u> achievement, often at unnecessarily low levels (Cooper, 1979). In general, observational research suggests that some (but not all) teachers treat high- and low-achieving students in highly differentiated ways that appear to have the potential for communicating low expectations to students and sustaining their behavior at unnecessarily low levels.

Detailed statements about how some teachers differ in their classroom behavior towards high and low achievers (e.g., waiting less

time for lows; rewarding inappropriate behavior and demanding less work from lows; etc.), as well as general guidelines for working with low achievers, have been reported elsewhere (see Good & Brophy, 1980). Some teachers differ in how they treat low achievement students and other students, but no consistent differences exist across teachers. However, variation in teacher treatment may cause additional problems for low-achieving students as they attempt to figure out their classroom roles (i.e., what's expected of them?).

Extreme Variation: A Potential Problem

Elsewhere, I have argued (Good, 1981) that students perceived to be low achievers by teachers may receive more varied behaviors from year to year because teachers agree less about how to respond to student failure than to student success. For example, some teachers may respond to student failure by ignoring it while other teachers are more likely to provide gratuitous praise and yet others respond to failure by criticizing it.

Previously, I have argued the potential problem for low-achieving students in the following way:

> Over time, such differences in the way teachers treat low achievers (for example, in the third grade a student is praised or finds teacher acceptance for virtually any verbalization but in the fourth grade the student is seldom praised and is criticized more) may reduce low students' efforts and contribute to a passive learning style. Other teacher behaviors may also contribute to this problem. The low students who are called on very frequently one year (the teacher believes that they need to be active if

they are to learn), but who find that they are called on infrequently the following year (the teachers doesn't want to embarrass them) may find it confusing to adjust to different role definitions. Ironically, those students who have the least adaptive capacity may be asked to make the most adjustment as they move from classroom to classroom. The greater variation in how different teachers interact with lows (in contrast to the more similar patterns of behavior that high students receive from different teachers) may be because teachers agree less about how to respond to students who do not learn readily.

It may also be the case that even within a given year low achievers are asked to adjust to more varied expectations. This may be true in part because low achievers have different teachers (in addition to the regular teacher they may have a remedial math, reading, or speech teacher). The chance for different expectations is thus enhanced. Certain teachers may also be more likely to vary their instructional styles toward lows within a given year. For example, they may give up on an instructional technique prematurely (when the phonetics approach initially fails the teacher tried another instructional method). (Good, 1981, p. 418.)

What are some of the conditions which are necessary in order for teacher expectations to function as self-fulfilling prophecies? First, to bring about a negative self-fulfilling prophecy, it would not appear necessary for teachers to exhibit all, or even many, of the behaviors

cited previously as indices of low expectations. If teachers assign lows considerably less content than they can handle, that variable alone could reduce student learning (even if teachers call on lows frequently, etc.). Similarly, if teachers give low students less time to practice reading (or allow frequent interruptions during allocated time), this could be a sufficient condition for reducing student achievement. Third, some of the teaching differences identified by observational research collected in the attempt to verify self-fulfilling effects seem to be illogical and/or inappropriate (e.g., less reading time for lows, noncontingent praise), whether or not the occurrence of the behavior is due to teacher expectations. Fourth, although naturalistic studies prohibit inferences about causality, teacher expectations are nevertheless a rich conceptual heuristic for looking at classroom behavior (Good, 1981).

The sources of possible expectations are almost limitless and potential sources include more than the behavior of an individual teacher. Curriculum materials, school grading practices, retention policies, and school suspension policies all help to create a sense of "direction" and communicate expected school behavior. Forces outside of the school may also help to establish expectations. Hall and Spencer-Hall (Note 21), for example, have noted that articles in local newspapers have helped to create expectations and school policies that would not have existed otherwise.

Needed Research: An Example

Because teacher expectation research demonstrates that some teachers do differentiate in their classroom behavior toward high and low achievers in ways that appear to constrain learning, and that

teachers' general expectations are associated with high- and low-achieving classrooms, it seems reasonable to examine how expectations are formed. One particularly advantageous research strategy would be to focus on new teachers. What beliefs do new teachers hold and what are the antecedents of these beliefs? Perhaps more important than teachers' specific beliefs about high- and low-achieving students is their general notion of the teachability of students. Although recent research has demonstrated that teachers make a difference, one wonders if new teachers believe this when they begin to teach. Do they feel that they can make a meaningful difference? Unfortunately, as I have pointed out elsewhere (Good, 1979), there are no systematic data to describe the ideas presented in various teacher training programs. It seems reasonable to assume, however, that teachers will spend more time and make more serious attempts to bring about learning during classroom instruction if they feel that they can have an effect on student achievement. It also seems likely that teachers who believe that they cannot make a difference would not spend large amounts of time preparing for classes, and that they would be more likely to attempt to avoid conflict and to fill up time in convenient ways rather than to make serious instructional efforts.

There are some data to suggest that efficacy expectations help to determine the level of effort and persistence that individuals will exhibit (Bandura, 1977). Perhaps in subtle ways teacher training institutions shape the personal efficacy beliefs that beginning teachers bring to the classroom. Teacher education programs may help to create erroneous expectations (too low or too high) of the extent to which teachers can influence student learning. The simple belief that

teachers can transform reluctant learners by caring about them, or the contrasting belief that teachers are powerless, may contribute equally to teacher frustration and dropout. Teachers need to understand that teaching is a very tough but feasible task. Teachers' expectations for simple solutions to problems can turn into anger, frustration, and, ultimately, withdrawal in the face of classroom realities.

Recently, in working with a control group of teachers in testing a mathematics program, we noted that these teachers' pupils made greater gains than would be expected, even though the teachers received no technical or conceptual training (Good & Grouws, 1979). We wondered if the presentation to teachers of information that they could make a difference in student learning was sufficient to generate increased effort which was associated with student gains. These data are indirect and there were other factors which might have been more central in producing the gain (teacher observation; the interest of the school district). Still, these findings do illustrate the plausibility of the efficacy hypothesis.

I am not advocating that all teacher education programs should enhance the efficacy beliefs of preservice teachers, although in some cases I suspect it would be important to do so. Considering that the literature on teaching effectiveness was so dismal in the late 1960s, and that much popular writing questioned the ability of schools to improve performance, it is possible that many training programs erode teacher motivation by stressing the difficulties associated with teaching.

I feel that other teachers suffer from a different problem. Namely, they enter the classroom with unrealistically high beliefs about

their ability to motivate students. These teachers may ultimately develop low expectations and give up because they cannot fulfill their initial inappropriate role beliefs. Obviously, appropriate expectations are the key (Good & Brophy, 1980), and a teacher's ability to enhance student performance necessarily varies across different contexts. One wonders how teacher educators respond to this issue. Given extant knowledge about classroom learning and teacher beliefs, it would seem important for teacher training institutions to examine this issue.

The topic of teacher expectations has been but briefly developed here and the reader who wants a more detailed review and critique of this research base may want to consult other sources (e.g., Good, 1980; 1981; Brophy & Good, 1974; Cooper, 1979). The evidence for a direct relationship between teacher expectations and student performance is less clear than the evidence for active teaching and classroom management variables. However, the consistency of correlational findings linking appropriate teacher expectations and better student performance across several studies suggest that this area of research deserves serious consideration by teacher educators and researchers. Earlier it was noted that the antecedent conditions that led some teachers on their own to develop active teaching styles and appropriate managerial skills have not been examined. It may be that appropriate expectations play an important mediation role in helping teachers to develop active communication skills. Teachers who obtained achievement gains seem to be ones who are willing to continue to work with students despite initial learning difficulty. They appear to have the expectation that students can learn and that their job as a teacher is to find a way to stimulate such learning.

New Directions in Classroom Research

I have discussed some advances in knowledge that have occurred in the past decade. I now turn to a discussion of some issues which need future attention. Each topic that appears below deserves a separate paper; however, because of space limitations, I can do little more than mention new directions here. Still, this brief identification of future issues should be useful for illustrating some of the directions that research in the 1980s will take.

Curriculum Research

Curriculum issues were a hot topic in the 1950s and 1960s (including the ineffective attempts to develop teacher-proof curricula). In the 1970s curriculum issues were placed on the back burner and all but forgotten. When subject matter was studied, it was typically a classification variable (e.g., observations were made in English and mathematics classes). This unfortunate neglect of possible curriculum differences within subject areas was especially noticeable in two research areas that received a great deal of attention in the 1970s, teacher expectations and teacher effectiveness. For example, there was extensive examination of how teachers varied their behavior toward high and low achieving students, but little attempt to study the possibility that students received different curriculum assignments. Also lacking serious study was the possibility that the curriculum or subject area might create expectations which influenced teacher behavior. Soltz (Note 22) has illustrated that teaching behavior is quite varied across areas of the curriculum. The same teacher acts differently when presenting different subject areas.

Recent research has illustrated why curriculum is an important issue. Jorgenson (Note 23) has demonstrated that in some classes 85% of the students were required to learn from material that was beyond their reading ability. Such a mismatch between student ability and content would seem to have negative effects on student learning and motivation. Another problem of ignoring curriculum content is illustrated in the work of Armbruster, Stevens, and Rosenshine (Note 24), who found that the overlap between reading texts and the standardized tests (used to estimate reading proficiency) was low.

Similarly, Porter, Schmidt, Floden, & Freeman (Note 25) examined the task that standardized achievement tests present to students and found sufficient variation from test to test to cause them to question, "Would students' performance on another standarized test have produced the same results?" In 1979 Doug Grouws and I responded to this issue by examining student performance on tests designed to cover the mathematics curriculum that teachers were presenting, as well as considering performance on a standardized test. Our study found that the curriculum that teachers were using and the content sampled on a standardized test were in many instances very comparable. Collectively, the results of these studies suggest the need to <u>test</u> the correspondence (and <u>not to assume it</u>) between the presented curriculum and how it is evaluated.

The Good and Grouws (1979) study also illustrated that teachers and teaching variables were associated with student achievement (i.e., curriculum differences did not explain differences in student achievement). Still, the use we made of curriculum was little more than an attempt to ensure that the test was fair for all teachers. The broader issues of <u>what is taught</u> and how <u>appropriately</u> have been largely

ignored in recent research. These issues need attention and information about them may be very important. At present, it seems that sometimes inferences about effective teaching are based upon research using outcome measures that may not be relevant to the curriculum that teachers are using.

The chance to study the curriculum was probably present in many of the descriptive, ethnographic studies that were conducted throughout the 1970s, especially in the late 1970s. Despite the fact that such studies have included more variables than the quantitative procedures of process-product research (which tend to focus on teaching behavior), no explicit attempt was made to examine curriculum issues.

I am not advocating a return to the earlier form of curriculum research which failed to integrate curriculum issues with the measurement of the behavior and beliefs of teachers and students. There have been several recent studies of how more and less effective teachers generally instruct in a given subject matter. It is possible that advice about how teachers effectively instruct in a subject such as mathematics may call for considerable differentiation in how teachers present a certain curriculum topic within that subject (fractions vs. verbal problem solving). Such advice might be affected by whether teaching occurs late or early in the school year and whether the material is taught at a particular point in time during the presentation of a topic (e.g., an introductory lesson vs. a consolidation lesson). Such questions will remain unanswered until curriculum research and classroom process studies become better integrated.

Teaching Context

Increased research attention needs to be focused on distinguishing between who is being taught, for what purpose, for how long, and in what type of social setting, if we are to obtain more adequate descriptions of classrooms. That teaching behaviors associated with a particular definition of effectiveness vary from one context to another has been demonstrated (see, for example, Brophy & Evertson, 1976).

Having said this, it is important to acknowledge that at present there is no precise definition of what constitutes a classroom context. I will not attempt an integrative definition, but it is possible to suggest some of the variables that appear to be aspects of classroom context (the interested reader can find additional statements about classroom context elsewhere, Brophy & Evertson, 1976; Ward & Tikunoff, Note 26) and to illustrate the complexity of the issue.

It is premature to make statements about how teachers need to vary instructional behavior across specific dimensions of context, because the data base for such statements is very narrow. One example of such a statement is provided by Good, Ebmeier, and Beckerman (1978):

> Teaching is complex and invariably teachers have to adjust their teaching to the particular group of students in their class. No pattern of teaching is going to apply uniformly in any setting. For example, on a probability basis it appears that low-SES students need more praise than do high-SES students. However, it is equally true that some high-SES students will benefit from teacher praise and that some low-SES students do not need high levels of teacher praise (p. 89).

Such conclusions do not yield compelling substantive directions but do help to indicate the complexity of the teaching situation. Individual student needs, abilities, and perceptions are also part of the classroom context and have to be considered in relation to other variables such as grade level and subject matter goals. Importantly, such findings should help to sensitize consumers of research to the problem that findings from a particular set of classrooms have unknown generalizability to other classrooms. Findings similar to those of Good et al. (1978) may also stimulate researchers to anticipate the limitations of their results more fully and to test such limitations more formally. The acceptance of the need for contextual research is important because it seems clearer now than a decade ago that there appear to be few if any teaching competencies that are equally important in all classroom contexts (Brophy, 1979; Good & Power, 1976).

Interest in context is rather recent, and most research in the past was designed to yield general statements applicable to a variety of teaching situations. Serious recognition of the potential importance of context in the study of teaching was noted by Dunkin and Biddle (1974), and, as indicated previously, recent research has shown that their concern was justified. The study of context has just seriously started and I believe many important statements about the effects of context on effective teaching will be available in the next few years.

It will be difficult to integrate context into the study of classrooms. For example, if the context of learning makes certain patterns of teacher behavior more or less desirable, is it not possible that different classroom contexts may also have varying effects on teachers? In what ways does the composition of a class (e.g., the mean

aptitude and its variance) make some classes more or less teachable in specifiable ways? Although teachers commonly express beliefs about the differences of "teachability" between classes, we have comparatively little evidence about how such variations in class populations influence teacher behavior and/or student behavior. For illustrations of the possible influence of class composition on classroom behavior, see Beckerman and Good (1981) and Evertson, Sanford, and Emmer (1981).

One might examine time of year as part of a contextual approach to the study of classrooms. It is important to question whether different process-product relations occur at different points in the year. Already there are data to suggest that the behavior of students and teachers appears to vary on some dimensions at different points in the year (Good, Cooper, & Blakey, 1980; Evertson & Veldman, Note 27). Good advice about teaching may thus need to be qualified by statements about time (e.g., early or late in the year), as well as by the type of student, the distribution of student types in a particular classroom, the type of goal sought (achievement vs. satisfaction), and the types of curriculum materials and tasks being taught.

The impact of a given teacher behavior may also vary in terms of the context in which it occurs within a particular classroom. Martin, Veldman, and Anderson (1980) report the importance of the immediate surroundings on the effects of certain teacher behaviors. For example, the effect of teacher feedback, such as praise for an individual student, was influenced by the amount of praise that other students in the group received.

Researchers next need to explain why "context" variables have an effect. Linda Anderson (personal communication) argues that a change in

task is a change in demands imposed by the situation and/or the resources available for meeting those demands. Using the criteria of demands and resources, one could argue that time of year is an important contextual variable because a teacher's tasks at the beginning of the year (vs. the middle or end) and the resources available (student knowledge and interest) are likely to be different at different times in the year. Similarly, procedures for monitoring and/or stimulating students' independent seatwork may vary because the "covertness" of the activity and the complexity of feedback (amount of time teachers spend with individual students) differ according to the subject matter being taught. Anderson's suggestions for examination of tasks and demands may ultimately be more functional to teacher educators than merely cataloging variables that are relevant to a context definition.

My discussion of context should demonstrate to teacher educators that classrooms are clearly complex environments and it is not easy to describe, understand, or to improve them. Shulman (Note 28), in responding to the difficulties of doing research in the behavioral sciences, states that context studies will have a confidence interval around them. More attention to context may help to inform us more about the situation in which research findings are likely to apply and may increase the applicability of findings to the particulars of individual classrooms. That is, in order to make the research applicable, generalized findings need to be related to the particulars of individual classrooms (Schwab, 1969).

Still, it is <u>not</u> likely that better context research will solve the problem of translating research findings into classroom practice. Classrooms vary in so many ways that even the best "contextualized"

studies will still have confidence levels around the findings. Research results have to be interpreted in terms of specific teaching conditions and goals. Recent research has demonstrated that teachers have to adjust research concepts and findings to their particular classrooms.

Kepler (Note 29) has also cautioned educators about an overreliance upon the scientific paradigm for the production of simple responses and has called for teachers to think more critically about their classroom behavior. If certain behaviors may not have similar effects, even in classrooms at the same grade level in the same school (e.g., because of the particular types of students in a given classroom), a basic question is raised: What levels of theory and generalization are appropriate? Colin Power and I have responded to this issue in the following way:

> We suspect that the generalizations deriving from classroom research and theory have a different role from those of the natural sciences. They function not as predictors of future events but as guidelines for understanding particular situations and contexts. Thus, at best, generalizations about teaching derived from research act as guides to assessing the likely consequences of alternative strategies in complex educational situations. Such generalizations must necessarily be indeterminant since they cannot predict precisely what will happen in a particular case. But this does not decrease their value for the teacher; he is not interested in establishing general laws. Theories can be of value in specifying those dimensions which are relevant to an understanding of classroom phenomena, can extend the range of hypotheses (alternative strategies)

to stop after the first study. The investigator finds that X and Y are (or are not) related and then moves to a different area of inquiry. Researchers need to build some planned context comparisons into their research models if only one study is to be conducted. Such comparisons would allow for more information about the confidence interval of the findings and the limits of their application. For those researchers who have continuing programs of research (and these are rare because of many factors such as the shifting priorities of funding agencies that make major sustained work on a particular problem difficult) the call is to build into future research a greater range of context comparisons by adding new variables over time.

Classroom: Task Structure

As noted above, classroom researchers have begun to examine a number of contextual variables. In this section I want to describe two research paradigms which focus upon a related form of classroom context. Both of the approaches described here could have been included in the context section of this paper; however, the level of argument and conceptualization is sufficiently molar to consider them as ecological settings in which more specific forms of contextual interactions take place.

Walter Doyle (Note 6; Note 30) has advocated the examination of task structure[1] and activity structure in the classroom because he feels that the two aspects differ in some, and possibly many, classrooms.

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[1]From Doyle's perspective (Doyle, Note 30) a task consists of two elements: (a) a goal and (b) a set of operations necessary to achieve the goal. There are two consequences to accomplishing a task. First, the person develops information (e.g., facts, principles, etc.) and also the person will practice operations (e.g., memorizing, analyzing, etc.).

considered, and sensitize the teacher to the possible consequences of his actions. Indeed, ultimately, the validity and usefulness of theory may rest in the hands of teachers...whether it sensitizes them to the classroom context, helps them make more informed decisions, and to monitor their own behavior. (Good & Power, 1976, p. 46.)

We are beginning to see that context effects are important and hopefully future research will provide more systematic ways of examining context issues. We know little about context because historically decisions about which context variables to include have not been made in systematic ways. For example, a researcher might want to test the impact of X (e.g., a phonetics method) on Y (students' reading comprehension) and decide to test the theory in first-grade classrooms. The initial context decision may be made for explicit, plausible reasons (e.g., first grade is chosen to avoid an interaction of X with previous types of instruction). However, many other context decisions are made for the researcher's convenience. A decision is made to control for student characteristics and since middle-class schools are available, they become the sample. Most teachers are using a self-contained organizational model, so teachers using an open-plan structure are excluded. Because most teachers are using a particular text, teachers using other curricula are deleted from the sample.

Because of the need to control for a variety of factors that might influence the relationship between X and Y, many arbitrary decisions are made. Up to a point, such an approach is useful, because planned comparisons are necessary. Unfortunately, however, most research tends

For example, the teacher may spend much class time having students diagram sentences (an activity); however, the teacher might choose not to test this skill (e.g., students are required to write original sentences). Obviously, such a discrepancy between activity and task would be missed by process-product researchers (who often schedule observations to avoid testing days!), and often missed by qualitative researchers unless they were in the class for several consecutive days. Doyle suggests the need to study broader relationships that may exist in the classroom and points out that one can misinterpret classroom events if a process at one point in time is emphasized without a clear understanding of what preceded or what will follow. It is also the case that students may not understand the "task" and become absorbed in activities devoid of any meaning, particularly if teacher behavior is ambiguous.

As an explicit case in point, Doyle (Note 6) notes that teachers have been found to reinforce (praise) inappropriate student responses. The reasons for such teacher behaviors may be laudable (e.g., the teacher wants to encourage classroom participation); however, the discrepancy between stated teacher behavior (give thoughtful answers) and accepted behavior (wrong answers) may teach students that the real task is to respond quickly and not to think. Such discrepancies between activity and task demands may communicate low expectations for student learning.

Discrepancies between task and activity can be accounted for in other ways. For example, such gaps may communicate that teachers are not fully aware of their instructional goals. Indeed, part of the explanation for why some teachers are more effective (e.g., their

students score higher on achievement tests than expected) may be that teachers are more adept at communicating task expectations. Task analysis represents one way in which curriculum issues could be integrated with classroom process research.

Doyle is also interested in the shared history that classroom participants possess and why certain tasks seem more or less difficult in different classrooms because of events that have taken place in the past. In my own experience as a classroom observer I have sometimes been struck by the particular forms of behavior and instructional possibilities that are present in some classrooms but not in others (even in the same grade level across the hall). Often these differences can be explained in terms of teachers, but sometimes they cannot. It seems that a particular combination of students with particular abilities and school histories can make teaching much easier or more problematic; however, it is also probably the case that different types of teachers react to class types in different ways. However, often the "teachability" of a class is not explainable in terms of student ability. Recently, while on sabbatical leave, I had the opportunity to do extensive observational research in a junior high school. Many teachers informally reported that their classes seemed to have distinct personalities. Teachers' explanations about the nature of the differences between classes and the extent to which such differences make teaching more or less difficult were quite varied. In formal interviews with students, I have found that they are aware of class effects. Some students do report that classes are different (e.g., noisier or more fun) because of student factors. In general, though, students tend to attribute differences between classes to teacher

factors. These student perceptions make sense, given that students do not see the same teacher with different classes. Because both teachers and students are aware of class effects it would seem that more formal and systematic inquiry is warranted.

A study by Copeland (1979) illustrates an aspect of classroom ecology. He observed that student teachers, when placed in certain classrooms, were unable to utilize skills that they had learned unless the cooperating teacher had been using the skills previously. It seemed that if a teacher skill was not part of the ongoing ecological system, students reacted adversely to it and eventually the student teacher stopped using the skill. Students then may attempt to control teacher behaviors that represent risks to themselves (see Doyle, Note 6). However, it should be noted that Copeland's study is a small one and that the findings do not necessarily represent the typical student teaching experience. They do suggest yet another way in which classroom life is molded. Systematic descriptions which explain and clarify the ecology settings of particular classrooms are needed.

It should not be assumed that class effects operate independently of the teacher. I recently had the chance to observe the same teacher teaching the same subject in two different periods. The instructor, an eighth-grade science teacher, had told me that his reaction to these classes were markedly different. He saw the first-period class as an easy but boring class to teach. In contrast, he saw the third-period class as easy to teach but enjoyable.

Upon observing in the two classrooms, I found several differences that were consistent with the instructor's belief. Students in both classes were allowed to choose their seats and to move desks as they

wished. In the first-period class, students spread themselves throughout the room; whereas, in the third-period class students chose to sit in a small, confined area close to the instructor. Obviously, such seat selection made communication with the instructor (and with one another) easier during the third period than the first. In particular, I was struck by the frequency of substantive questions that were raised in the third-period class, but not in the other class. Indeed, students in the third period were able to pursue their own agenda and many content discussions took place in the third period that did not occur in the first-period class. Hence, there were differences in the two classes not only in terms of interaction, but also in terms of the content that was being examined.

Despite the differences in the two classes, this particular instructor appeared to be able to control these differences (to some extent) when he wanted to do so. For example, one day before the third-period class began the instructor was kidding around with three or four students at his desk (behavior which did not occur in my observations in the first-period class). When he began to talk he was immediately interrupted by several questions. His response was, "Let's hold questions for a bit because I want to give some information." These comments were sufficient to reduce, but not completely constrain, student questions (although their question rates remained higher than the first-period class, even when no instructor constraints were applied). Presumably, this teacher behavior was sufficient "negotiation" to inform the class that their agenda would be responded to subsequently. It seemed clear to me that although there were

important differences in the two classes, the influence between instructor and class was bidirectional.

It was informative for me to subsequently observe a social worker interact with these two classes. Because she did not understand differences between the two classes, her presentational style led to conflict (managerial problems) with the third-period class (mainly because they were used to being able to pursue their own agenda as well as the instructor's and her behavior precluded this). This example suggests that composition effects and "shared" histories in individual classrooms do exist and do influence instructional behavior. However, it also implies that instructors are not powerless in the face of such class effects. It appears that "class effects" may have positive or negative effects, depending upon how instructors react to them. Clearly, more research on the antecedent conditions that produce class effects is needed (is it because students in the third period know one another better, or due to countless other factors?), as well as research on the impact of student composition variables on student outcomes.

Doyle's (Note 30) analysis of classroom tasks essentially raises the question of what types of information processing are required and how are classroom resources used to make activities and tasks more similar. In general, I find his perspective an interesting one and I feel that teachers and teacher educators need to consider more carefully the task demands that are created in the classroom. In the long run, I suspect that it will be important to integrate task demand research with research that also examines the motivational role of teachers. Doyle's present model assumes that students are active processors of information; however, many teachers face the problem of dealing with

students who have learned to avoid processing information (e.g., face-saving attempts to make failure more acceptable). Ultimately, teachers' affective roles need to be integrated with their roles as task organizers. A growing volume of literature suggests that although humans are capable of active thinking and information processing, they often choose not to do so (see for example Langer, Blank, & Chanowitz, 1978).

Task Structures: Another Perspective

Steve Bossert (1979) has been concerned about the distinctive types of work organization that exist in the classroom and how such organization influences outcomes of schooling (achievement, friendship patterns, etc.). Doyle has placed emphasis upon the cognitive-psychological perspective (i.e., how students process information and how teachers can facilitate that process). In contrast, Bossert assumes the perspective of a sociologist and is largely concerned about the work conditions that surround the task. Bossert has made an important contribution in analyzing the conditions under which classroom tasks are carried out. Bossert has argued that the classroom task structure influences student self-perceptions and achievement in important ways. His work examines the influence of various structural dimensions (public vs. private evaluation; all students working on the same task vs. students working on different tasks and receiving evaluation related to their work; teacher-assigned tasks vs. student selection; and many other variables). Some of his data are intriguing and suggest that certain task structures may encourage certain teacher and student behaviors. This is important research, and it provides a nice methodology for exploring classroom work conditions that may

of differential teacher treatment. Hence, it seems that students' perceptions of teacher behavior are not necessarily affected by the presence of different task structures in the classroom. In contrast, some research has shown a relationship between ability perception and activity structure (Rosenholtz & Wilson, 1980). However, there are no integrating studies which examine teaching behavior and student behavior in a sustained systematic way, while also examining task and activity structure. As suggested above, to ignore either dimension probably creates error variance, at a minimum, and in some cases leads to inaccurate description and specious argument.

The work of Doyle (Note 30) and Bossert (1979) represents an important step in integrating curriculum and classroom environment variables into the study of classroom effects. However, it seems that a concurrent focus on teaching variables would enhance the "interpretability" of data collected along the lines suggested by these researchers.

Student Effects on Teachers

Past studies of teacher effectiveness, and process-product studies in general, have been legitimately criticized on the grounds that they have ignored student behavior and beliefs. This appears to be an important omission, especially in secondary schools where it would seem that student effects on teachers are more powerful because students have more social skills and a greater knowledge of classroom life from which to draw. There is ample evidence to show that student influence effects do exist, even at the elementary school level (for examples, see Doyle, Note 6; Note 30; Good, 1979). Mehan (1979) found in one particular classroom that students had influence on one another as well as on the

influence classroom behavior and outcomes. However, it should be noted that the initial study was based upon a sample of only four classrooms and thus the generalizability of the results is unclear. Furthermore, the data are correlational and the effects of certain activity structures probably interact with teacher and student characteristics. The effect of a given activity structure may be less general than Bossert's initial work suggests.

Anderson and Scott (1978) have found that different activity structures have various impacts upon the attention of different types of students. They report that different teaching strategies (group work, visual presentations, seatwork, class discussion, lecture) had distinctly different impacts upon the attention of students of different aptitudes and self-concept levels. It should be noted that Anderson and Scott's teaching strategies are not conceptually equivalent to Bossert's notions of activity structure. A comparison of the two studies suggests that student styles, teacher styles, curriculum, and activity structure are all important dimensions of classrooms and that an exclusive focus on any one dimension will not provide a complete picture. Such an attempt at understanding and integrating the concurrent effects of active teaching, task structure, activity structure, and type of student is being addressed in ongoing work at the Far West Laboratory (Mitman, Mergendoller, Rounds, Packer, Dadey, Ward, & Tikunoff, Note 31; Ward, Rounds, Packer, Mergendoller, & Tikunoff, Note 32).

Recent research by Marshall, Weinstein, and Middlestadt (Note 33) and by Weinstein, Middlestadt, Brattesani, and Marshall (Note 34) has illustrated that classroom structure (a pen and paper measure of openness) does not relate in any consistent way to students' perceptions

teacher (e.g., taking turns). However, the importance of the influence is not presented in compelling terms. Thus, research is yielding interesting examples of student influence but we are a long way from possessing research that suggests the various types of influence that students exert and the importance of such influences in different contexts (e.g., elementary school vs. junior high).

Other work suggests that as some individual students attempt to influence teachers, they do so in ways that maintain their relationships with peers. Dee Spencer-Hall (1981), in an interesting ethnographic study, has shown that some students are better at this task than others. She has observed that students' different rates of misbehavior are not always as important in cuing teacher evaluations as are students' styles of misbehavior. Many students are able to maintain a favorable evaluation by teachers and peers alike by being careful to misbehave in a way that escapes teacher attention.

Examination of classroom behaviors other than public exchanges may show more student effects in the elementary grades (younger children are likely not to cooperate through passive aggressive behavior). The literature on student effects is still so sparse, though, that any statements are highly speculative. More attempts to put a student face on classroom research are needed. The possibilities of such research are intriguing. For example, Doyle (Note 6) suggests that students work to reduce risk and ambiguity in the classroom. If, for example, early in the school year student "groans" following a teacher announcement result in a changed teacher behavior which reduces classroom risk (the teacher gives students a list of ten questions, five of which will be on the exam), what are the long-term implications?

More important than the observance of a particular student effect would be the integration of the effects into a broader network of classroom influences. For example, do students perceive teacher accommodations as emphatic, and, hence, do they cooperate more on subsequent tasks, or does yielding lead the teacher to be perceived as vulnerable and cause the demands for teacher adjustment to escalate? More appropriately, one might ask when student effects are likely to occur, and how these effects influence different types of teachers and students. It seems probable that many student-teacher negotiations take place without conscious awareness of participants (mutual adaptation). It would be interesting to study situations and types of conflicts that might tell us more about influence attempts.

There has been important work on students' thoughts about classrooms (Jackson, 1968; Cusick, 1973; Nash, 1973; Metz, 1978). There is also a vast literature that reports student opinion as measured by survey instruments. Unfortunately, student views are presented in this research as classroom means (what the average student thinks), and much of the potential for exploring the complex beliefs that may exist is reduced by combining individual student responses into group averages.

Questionnaire research also typically commits two other types of errors. First, responses are often summed across different types of response modes. Questionnaires may ask students to respond to questions about preferences (I like), norms (I should), beliefs (I do) but then treat the responses as though the response modes were irrelevant. Failure to make such distinctions reduces the power of the data and doubtlessly leads to confused interpretation on occasion. For a serious

attempt to clarify certain aspects of the response modality issue, see Biddle (1979).

It should also be noted that survey instruments sometimes fail to distinguish between the various aspects of classroom life. Doyle (Note 6) contended that students spend time thinking about academic demands. In contrast, Cusick (1973) noted that students are concerned about the social world of school. It is plausible that at least some students feel good about one dimension of schooling but dissatisfied with the other. Obviously, questions like "Do you like school" (very much vs. definitely not) may fail to measure critical aspects of student attitudes. Given our lack of knowledge in this area, it is probably presumptuous to contend that the curriculum should be adjusted only in terms of the "student perspective," as though the student perspective was a known reality. We need to clarify the student perspective and <u>then</u> consider the implications, if any, of such clarifications.[2]

To fully represent student thinking it may be necessary to understand the perspective of every participant in the classroom. (In reality this is the task that classroom teachers have.) From a research perspective, the need to sample every student is a very costly and time-consuming process. It appears advantageous to attempt to strike a balance between researching the effects of curriculum and instructional exchanges on the <u>average</u> students vs. each <u>individual</u> students. If a balanced approach can be found it might be possible to study classroom effects in a way that has both internal validity (sufficient numbers and

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[2]Based upon my recent interview work with junior high students it seems clear to me that there are <u>multiple</u> student perspectives.

types of students are included so that the data do reflect what takes place in a given classroom) and the potential for studying how these effects are different in other classrooms. Time and money saved by sampling a few students in each classroom could be used to study a wider range of classrooms.

If we can identify types of students it would then be possible to ask, "How do different types of students mediate classroom behavior, or how do different types of students place various demands on teachers?" and so forth. One possible approach that has some appeal to me had its roots in Phil Jackson's (1968) work in which he asked teachers to describe their feelings toward students. Subsequently, Jere Brophy and I conducted research which illustrated that teachers do interact differently with the students toward whom they report different attitudes. Power (Note 35) replicated the typologies that Jackson reported, but in secondary classrooms rather than in elementary classrooms, and by using peer and self-descriptions, achievement and personality tests, and teacher reports.

Colin Power and I (Good & Power, 1976) have developed a conceptual model to describe the types of students who are commonly found in classrooms (e.g., social, dependent, etc.). Bill Tikunoff, Betty Ward, Tom Rounds, John Mergendoller, Alexis Mitman and others at the Far West Laboratory are integrating their recent findings (based upon behavioral observation of students in the classroom) with the conceptual framework that Power and I described. It seems that our framework (derived from teacher and student perspectives and from testing) is basically replicated when another methodological filter is used to identify student types (constitutive ethnography). However, some important

aptitudes into a particular context and hence to integrate student perspective with teacher behavior and curriculum. This is another approach to representing the student in classroom research.

Student Mediation

Educators and researchers have become quite interested in student mediation variables during the past few years. Many writers have argued that classrooms are complex and that they demand the selective attention of teachers (e.g., Jackson, 1968). Students must also selectively attend, although there are typically fewer information processing demands on them than there are on the teacher. The teacher has to monitor in one way or another the behavior of almost all class members while also presenting information. In many circumstances, students need to pay attention only to the teacher. Still, much teacher behavior is ambiguous (Good, 1980) and students have to make inferences about what teachers say and the implications of their statements. If all students listen to a teacher lecture, to what extent do student mediation variables subsequently influence student learning outcomes? Obviously, the possible questions that one could raise in this area are almost limitless. To cite one research possibility, "Do students who anticipate being tested in different ways attend to the same lecture in different ways?". The central issue in student mediation research is whether (and how) students perceive and internalize similar teacher behavior in different ways.

Yet another reason to explore student variables is that much student time (at least in some classrooms) is spent working in groups independent of the teacher. Hence, some students have greater access to input (because of their skill in obtaining information and/or because of

extensions and additions to the conceptual system have been made, and at present there is interest in using such an integrative typology conceptualization to explore the effects of moving from one school setting to another on different types of students (the transition from elementary to junior high school).

It should be noted that the typology work is promising but it still is in a descriptive stage and that tight predictive validity studies remain to be conducted. Such work may eventually tell us whether it is useful to consider phenomenological concerns (recognizing that distinct views result from the perspectives of different participants), as well as whether it is useful to consider the limits imposed by classroom constraints (whether one can fully think about the needs of from 30 to 150 students). One of the persistent arguments of recent professional literature concerns the degree of consensus and conflict that exists in classrooms (whether various students interpret the same teacher behavior in the same manner). Research dealing with integrative typologies may help to clarify this debate to some degree.

Another way for researchers to take into account the student variable is to study the student perspective in a particular context. Howard Ebmeier has developed a series of questions about students' preferences and beliefs about mathematics as they relate to specific forms of mathematics instruction. Using his instrument, we found that different types of students were influenced by definable types of mathematics teaching (Ebmeier & Good, 1979). Several recent ATI studies have included non-cognitive variables as aptitudes within the ATI model (Peterson, 1977; Cunningham, 1975; Bennett, 1976; Solomon & Kendall, 1979). However, our study tried to place non-cognitive student

the students they work with), and may come to have more integrative pictures of their role as students as well as a better knowledge of task and teacher demands. Through a variety of ways students may become attentive to classroom cues and an awareness of these cues and an understanding of how students use them can be obtained only by studying students (behavior and/or perceptions).

Cognitive psychologists have explored a number of social-cognitive perspectives under laboratory conditions for some time and continue to have much interest in mediation research. Swarthout (Note 36) has recently reviewed different social-cognitive approaches that could be used to explain student mediation. Doyle (Note 30) provides a nice analytical review of the issues surrounding student mediation questions, and his work is an important statement on the topic.

Part of the difficulty of studying student variables is that the methodology for doing so is virtually non-existent. Several pen and paper measures (e.g., locus of control measures, etc.) have been used in the past to explore students' perceptions of self in order to explain why some students exert more effort in achievement situations than do other students. (For a thorough review of this literature, see Stipek & Weisz, Note 37).

However, as other researchers have noted, pen and paper measures yield only sketchy descriptions of student thinking. Consider the difficulty of eliciting the following perception, taken from Shepherd (1973), with a pen and paper measure.

> Me and Schwartz and Woczniewski sat so far back in the classroom that the blackboard was only a vague rumor to us. Miss Schields was a shifting figure in the haze on

the distant horizon, her voice a faint but ominous drone punctuated by squeaking chalk. Within a short time I became adept at reading the inflection, if not the content of those far-off sounds, sensing instantly when danger was looming. Danger meant simply being called on. Kids in the front of the classroom didn't know the meaning of danger. Ace test takers, they loved nothing more than to display their immense knowledge by waving their hands frantically even before questions were asked. Today, when I think of the classrooms of my youth, I see a forest of waving hands between me and the teacher. They were the smartasses who went on to become corporation presidents, TV talk-show guests and owners of cabin cruisers. . . .

I made it a point to wear bland-colored clothes, the better to blend into the background. I learned to weave my body from side to side, dropping a shoulder here, shifting my neck a few degrees to the right there, with the crucial object in mind of always keeping a line of kids between me and the teacher's eagle eye.

For those rare but inevitable occasions--say, during a chicken-pox epidemic--when the ranks in the rows ahead were too thin to provide adequate cover, I practiced the vacant-eyeball ploy, which has since become a popular device for junior executives the world over who cannot

> afford to be nailed by their seniors in sales conferences and other perilous situations. The vacant eyeball appears to be looking attentively but, in fact, sees nothing. It is a blank mirror of anonymity. I learned early in the game that if they don't catch your eye, they don't call on you. Combined with a fixed facial expression of dead-pan alertness--neither too deadpan nor too alert--this technique has been known to render its practitioner virtually invisible (p. 144).

Pen and paper measures of students' perceptions and beliefs are widely recognized as inadequate, but at present alternative methodologies for exploring student mediation variables are lacking. Some researchers have started to respond to this need. Rhona Weinstein, along with Hermine Marshall, Susan Middlestadt, and Karen Brattesani, is beginning to develop interview procedures for attempting to understand student perceptions and their role in classroom learning (Weinstein & Middlestadt, 1979; Weinstein et al., Note 34). Weinstein and her colleagues have also developed pen and paper measures of students perceptions of teacher behavior. It will thus be possible at some point in time to compare students' reports using both methodologies, according to which form of inquiry was used by the researchers.

Their initial decisions about what aspects of student perceptions to measure and differentiate are based upon clear concepts. Hence, the empirical results that follow will be especially important. Although it is not possible to report extensively their substantive findings here, it is useful to provide a few examples to illustrate the usefulness of their work. Weinstein and colleagues have found that students'

perceptions of differential treatment appear to be especially salient in the areas of task assignment and classroom management. High students are perceived (by other students) as having more choice in choosing academic tasks, and more opportunities for demonstrating mastery (e.g., they get extra time if they request it) then do other students. Similarly, students feel that high-achieving students can get away with minor disturbances (no teacher correction) to a much greater extent than can other students (in my own interview work at the junior high school level I have had many students who express views similar to those reported by students in Weinstein et al.'s research).

Furthermore, it seems that in some classrooms students feel that all students are smart and can learn. In contrast, in other classrooms students report that only some students can learn. Such student perceptions would seem to have the potential for influencing student motivation and student achievement.

Space restrictions have made it possible to mention but a few of the findings from Weinstein et al.'s program of research. Also, the research collected to date leaves a number of questions still unanswered. As a case in point, it seems important to see if students' perceptions of differential behavior related to classroom teaching and to see what, <u>if any</u>, impact students' classroom perceptions have on their own behavior and achievement. Weinstein et al. are integrating their study of perceptions with observations of classroom structure and process in their next study. Their research program is an extensive, programmatic effort. It represents very important and careful research that has much potential for clarifying the role of student perceptions in classroom learning.

In connection with the earlier discussion of curriculum, it seems important to explore student thinking about teacher behavior, classroom activities, and content in particular subject areas. Of primary interest is the distinct possibility that variations in students' understanding (interpretations of classroom process) are related to subject matter. Confrey and Lanier (Note 38) and others at the Institute for Research on Teaching have explored individual students' mathematical conceptions through the use of clinical interviews with junior high students. Their goal is to assess the potential of adjusting instruction to accommodate students' perceptions of mathematics. The focus upon understanding student beliefs and abilities with a particular subject represents a distinct and needed contribution to the study of classroom learning. In addition to exploring substantive questions, this research is developing new methodological tools for assessing students' perceptions of subject matter.

Bill Tikunoff, Betty Ward, John Mergendoller, Alexis Mitman, and others at the Far West Laboratory are developing interview procedures for measuring student perceptions of various social-cognitive variables (e.g., Do students feel that teachers distribute their time fairly among students?) and what, if any, implications these variables hold for classroom behavior (e.g., Do they influence student participation levels?). These researchers also hope to articulate a broader ecological perspective of schooling (see, for example, Tikunoff, Note 39; Tikunoff, Ward, & Dasho, Note 40). In exploring ways to examine and clarify successful school practices, they have adopted and expanded research strategies from a variety of perspectives (Bossert's notion of

activity structure; Mehan's work on student participation style) and are operationalizing different social-cognitive perspectives.

The possibilities in these research programs are interesting, but there are a number of methodological problems that have to be solved first. Indeed, perhaps the most important contributions of this work will be methodological ones. Techniques for interviewing students and measuring certain beliefs are needed, as well as creative and useful procedures for describing student behavior. There are countless dimensions on which student perceptions could be examined. Conceptual and empirical guidelines which direct researchers toward topics that appear to be profitable to pursue must be developed. Again, work in this area is new and demands attention, but as quantitative and qualitative techniques for studying student mediation are developed and refined, much will be learned about student perceptions of classroom phenomena.

Another attempt to explore student variables is seen in the work of Linda Anderson and several colleagues at Michigan State University. These researchers are just beginning a research project that appears to be an interesting approach to the student mediation issue (Linda Anderson, personal communication). Historically, teaching research has examined the influence of teaching behavior on distal criteria. Anderson et al. want to examine the immediate reaction of students to instruction. By checking work samples it will be possible to assess the relationship between student performance and various classroom acts. Also, students will be interviewed in order to assess their perceptions of daily performance, self-initiative, and self-direction as well as their general understanding of classroom tasks and instruction. Such

information may help to better articulate how students think about classroom tasks.

Although more information is needed about the beliefs of classroom participants, we should continue to study their behavior. Elsewhere I have recently restated the need for studies of teacher thinking, but urged that the study of teacher behavior not be neglected in the process (Good, 1979). My persistent advocation that researchers should continue to measure teacher behavior while exploring other dimensions of classroom life is based upon my observations in elementary schools. It seems clear to me that what teachers do or fail to do is the environmental variable that seems on the average to most consistently influence student performance.

It is also the case that we need to continue to study teacher perceptions as well. The recent research of Jere Brophy and Mary Rohrkemper illustrates that information about teachers' perceptions of classroom events increased one's ability to clarify why teachers behave in different ways (Rohrkemper & Brophy, Note 41; Note 42). More research is needed on other variables but to ignore teaching behavior, at least in elementary schools, would appear to be self-defeating. It is important that classroom research become more integrative (i.e., not just address a greater range of classroom variables). As a case in point, Mary Rohrkemper (personal communication) is presently interviewing a large number of elementary school students. Her work is important not just because she is providing attention to students' views (admittedly a research area that has received too little attention) but because her work can also be related to teachers' beliefs about

management (students who are being interviewed are varied by presence or type of behavior problems and type of teacher).

I suspect that student variables (including their beliefs and behavior as well as particular abilities) will prove to be more important determinants of classroom behavior and outcomes in secondary schools than they are in elementary schools, and individual teachers at the secondary level will be somewhat less important.[3] Even if this analysis proves to be correct, it would still seem important to maintain a concurrent interest in teacher behavior and curriculum (e.g., content, task structure) while exploring student variables. For example, it seems reasonable to believe that certain classroom events (e.g., teaching behavior and classroom structures) can influence student perceptions and behavior by helping students to perceive task demands more clearly and/or to organize information so that they can process it more efficiently. I believe that some teachers are simply more adept at sensing the "information load" that students can handle and that teachers are thus an important determinant of classroom learning at every instructional level.

Integrating Research Methodology

A major reason new and useful knowledge was generated by classroom research in the 1970s was that widespread observation of classroom practices was undertaken for the first time in educational research. There were (and still are) many problems associated with the quantitative measures that were used in observational research; however,

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[3]Interestingly, in interviews with eighth-grade students I find that students consistently believe that teachers are an important determinant of learning and that some teachers are more important than are other teachers.

there are good reasons for noting the frequencies of various classroom behaviors. A number of variables that were very attractive to educators at one time or another have been "debunked" because of "counting" research. It is true that in many cases, studies of behavior which fail to explore the way classroom participants perceive and interpret others' behavior will not be able to explain relationships between teacher behavior and student outcomes. Other research strategies are necessary for explaining classroom phenomena (e.g., students may report that factual questions do not encourage guessing and thus such questions may lead to more active reading and hence more integrative understanding). It seems pointless to defend "counting" (process-product) strategies as long as most quantification is directed toward variables that have psychological or sociological meaning as well.

To reiterate, I have considerable enthusiasm for expanding the measurement of classroom processes beyond the study of teacher behavior. However, it makes sense to count certain behaviors and time units in the classroom, as it also is practical to attempt to understand broader patterns of behavior that are not measured by frequency counts. Both methodologies are needed. The concern with qualitative variables is good; however, if carried too far it may become dysfunctional.

As Koehler (1978) notes, we need educational researchers who are describers (those whose chief interest is to understand classrooms), as well as those who intend to improve classrooms. Power (1977) responds to this issue in a way similar to Koehler by stating that all well-conducted research has important dual roles. He contrasts the normative-scientific paradigm and the interpretative-ethnographic paradigm and notes that in their extreme forms both positions have

fundamental weaknesses. Commenting upon the normative-scientific paradigm in its extreme form, Power points out that it contains two basic orienting ideas: (1) interaction is fundamentally rule-governed, and (2) explanation should assume the deductive form of the natural sciences. Research models in this tradition focus on stable features of interaction and upon generalization across classrooms, about relationships which are possible and useful. As Power states, however, the normative-scientific approach rests upon the assumption that a system of expectations is shared by all participants, and recent research has shown that such cognitive consensus is unusual in classrooms. Unfortunately, as Power notes, the assumptions involved in this research tradition are better suited for examining simple, closed, static systems than they are for exploring the dynamic processes of classrooms. This is why I have emphasized that those who study teacher behavior need to explore the idea of student participation more fully, as well as the meaning of various classroom ecological variables.

Power notes that the most important assumption of the interpretative-ethnographic paradigm is that the meaning which students and teachers attach to classroom events is an interpretive process in which their interpretations form and change in terms of the context in which perceived behavior has occurred. Interpretation of a behavior also relates to what is expected to follow that behavior. He writes,

> Teaching and learning then must be understood in terms of the values, purposes and perceptions of the participants, rather than in terms of constructs deriving from some pre-structured instrument or psychological theory. The theories sought are restricted to particular contexts and are not

> generalizable. The purpose of theory is to describe and explain what is happening in a given context rather than to prescribe or predict what should happen. (Powers, 1977, pp. 21-22).

The presence of qualitative research strategies per se will not improve our understanding of classroom life. Accounts of the subjective meanings that various participants attach to classroom behavior are needed. However, these subjective interpretations have to be understood in ways that are sensitive and valid. Until qualitative researchers develop procedures for establishing the validity of narrative descriptions, it will be difficult to differentiate accurate and specious accounts of classroom events. On the other hand, until quantitative measures include the understanding that participants attach to classroom behavior, the phenomenological validity of process-product research will be open to question.

I agree with Power, that it is time to realize that both change, conflict, and particularization (which ethnographic researchers emphasize) and stability, consensus and generalization (which those who pursue the scientific paradigm emphasize) are equally important dimensions of classroom life. To understand classrooms we need to accept this equality and to develop integrative strategies that can respond to both approaches simultaneously. Fortunately, classroom research is beginning to move in this direction.

Just as "commitments" to a single focus (e.g., the curriculum) have led to narrow and relatively unproductive findings, a commitment to a single line of inquiry will not optimize our knowledge of classrooms. It seems to me that as classroom research is maturing and becoming more

integrative and more powerful, mini-theories of aspects of classroom life may emerge in the future. However, teachers will still have to integrate research perspectives into their own network of values, goals, and judgments about the students they teach. Hopefully, research can help teachers to explore a wider set of possibilities and can provide more powerful concepts for examining classroom events.

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